

ABSTRACT OF THE DISCLOSURE

Authentication systems, apparatus, and methods authenticate an identification marking including a nanocrystalline material. One or more properties of the marking are ascertained to provide a measured profile. The measured profile is compared to at least one member of a closed set of reference profiles. Each reference profile has predetermined values of one or more properties. Each reference profile is unique within the set. At least one reference profile is characteristic of an indicator material in a nanocrystalline morphology and non-characteristic of the same indicator material in a bulk morphology.

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